Negotiation Support Systems: Communication and Information as Antecedents of Negotiation Settlement

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Abstract. Innovative approaches such as the use of technology in negotiations raise questions of how technology interacts with the manifold contextual factors that play a role in negotiations. In this article, we introduce a theoretical framework that seeks to inform the design of Negotiation Support Systems (NSS) by focusing on two antecedents of negotiation success. On the one hand, we argue that NSS should stimulate a common (cultural) identity among the individual negotiators, a strong predictor of integrative agreements in prior research. On the other hand, NSS should seek to provide information in order to develop shared cognition among negotiators. Negotiators’ perceptions of the problem at hand and possible solutions often diverge significantly as a consequence of their different knowledge and motives. In this article, we report some experimental support for this framework. We conclude that shared identity and shared cognition are relatively powerful predictors of outcomes of international negotiations, and that minimal variations in the configuration of an NSS can have strong effects on these results.

Keywords: Negotiation Support Systems, shared cognition, common cultural identity, information, communication, ecological validity, international negotiation.

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Introduction

In the field of negotiation research, the question of how technology can be used to productively support negotiations is relatively new. In the past decade, pioneering studies have been carried out to examine the impact of various forms of technological support on negotiation processes and outcomes (Chun 1998; Kersten 1993, 1996; Ulijn 2001). Others have suggested some theoretical directions along which such systems could successfully be developed (Lim & Benbasat 1993). The present article seeks to offer a slightly different perspective to the emerging literature. This perspective is generated by our belief and experience that a successful support procedures design is rooted not only or even primarily in technological feasibility, but also in an understanding of the ecology of the activity that requires support (Lea & Giordano 1997). More specifically, prime factors to be considered are the nature of the negotiating groups and their inter-group relations (Haslam 2001). Such factors should be especially important in international negotiations, where different cultures, norms, and values influence both negotiation process and outcome (Brett 2001), and will need to be taken into consideration for the fruitful design of instruments to support negotiations.

The dual message of this article is relatively simple and straightforward. We explore a framework that intends to inform the design of Negotiation Support Systems (NSS). First, we argue that the social processes underlying international negotiations are both highly complex and of fundamental importance to the outcome. As we elaborate below, the design of support systems should aim to facilitate these processes, and as such, be geared towards enabling and stimulating a set of complex communications that are at the heart of negotiation settlement. Second, and not independent of the first, we argue that negotiation support should aim to provide negotiators with information to maximize shared cognition among them. This is because, as we argue, shared cognition is fundamental for parties to understand thoroughly the nature of their disagreements, which is ultimately the common ground from which satisfactory settlement can be reached.

To this end, the article is structured in three parts. In a first section we examine the social complexity of the negotiation situation and what this implies for the way in which NSS should aim to support communication. In the second section, we discuss how NSS should provide information to maximize shared cognition and why this is important. Then, in the third section, we present some preliminary results from our research program to illustrate the kinds of NSS and procedures that we have been exploring and how they have fared empirically. Finally, we conclude by integrating the three segments and by outlining our research agenda for the near future.
A Framework for Negotiation Support

It has often been argued that, ideally, negotiations are conducted in an atmosphere where negotiators can be hard on facts and soft on relationships; in other words, cognitive conflict should be possible without affective conflict, and disagreement about information should not obstruct communication (Amason & Schweiger 1997; Jehn 1994, 1995). This classic observation introduces the two key ingredients of negotiations: information and social processes. Although most would agree that both are essential, the two are rarely studied in conjunction. Researchers and theorists alike tend to focus on one or the other. Although it is acceptable for researchers to do this (examining one set of variables while keeping others constant), it should be noted that negotiation support should always take both dimensions into account. Therefore, our framework tries to consider both communication and information.

Supporting Communication

In the negotiations literature, the importance of social processes is widely acknowledged. For example, De Dreu and colleagues (De Dreu, Weingart, & Kwon 2000) recently examined the importance of socio-emotional factors in a meta-analysis of the influence of social motives on negotiation. Their review shows that negotiators with prosocial motives engage in more problem-solving, less contentious behavior and achieve higher outcomes compared to negotiators with an egoistic motive. Their result is but one of many that illustrate the importance of good relations between negotiators during their talks. It can be said that pleasant rapports between negotiating parties are a vital ingredient of negotiation success.

The dilemma that characterizes negotiations is that in many cases the very reason that negotiations are necessary is because these relations are somehow strained, because a conflict exists between parties or because their goals and interests are incompatible. In addition, perceptions of differences and disagreements can arise or deepen when groups have so little in common that communication is hindered, for example because of cultural differences that give rise to misunderstandings. Thus, a key predictor of successful resolution is often at risk right from the start. One of the purposes of negotiation support is therefore to improve the communication climate. When thinking about NSS, an obvious way to improve the environment is by varying characteristics of the communication medium, thereby attempting to affect the level of positive socio-emotional communication among negotiators.

This reasoning is supported by the research of Kahai and Cooper (1999), who found that socio-emotional communication in computer-mediated negotiation
plays an important role in the development of productive negotiation outcomes such as agreement and acceptance. Thus, in order to successfully support negotiations, NSS should aim to provide negotiators with a communication environment that enables them to cooperate over more than just facts, figures, and the task at hand. The social richness of a negotiation environment may facilitate success (Polzer, Mannix, & Neale 1995; Putnam 1997). In general, it is assumed that richer environments enhance one’s ability to relate to others, and that the capacity to engage other people more directly will generally increase the likelihood of “good” interpersonal relations. For example, research has suggested that “richer” media such as face-to-face communication and video lead to more collaborative behavior than do phone conversations and chat negotiations via the Internet, although differences diminish over time (Purdy, Nye, & Balakrishnan 2000; Suh 1999). Likewise, Sheffield (1995) showed that richer audio communication was associated with a better negotiation outcome (higher joint profit) than textual communication.

However, research has also shown that in some instances, a restriction in the bandwidth of communication channels can lead to more socio-emotional exchanges, namely in groups whose shared identity was made salient (Lea & Spears 1991). Indeed, a range of studies has shown that in groups that already share a common group identity (hence, in which conflict and disagreement are not salient) anonymity in communication may actually accentuate the unity of the group (Lea, Spears, & De Groot 2001; Postmes, Spears, & Lea 1998).

It would appear, then, that variations in the ways negotiators are able to communicate with each other considerably impact negotiation outcomes. It should be pointed out, however, that there is no single and simple recipe for success. The research conducted to date in the area of computer-mediated communication suggests that the degree to which communicators establish a sense of shared identity plays a pivotal role in negotiation success. Recent research suggests that negotiators’ chances of reaching a successful settlement depend on their ability to identify with a common or overarching group identity (Gaertner, Dovidio, Anastasio, Bachman, & Rust 1993; Haslam 2001). Thus, achieving a common identity of some form should be a prime concern for those seeking to support the negotiation.

However, the involved parties must consider whether common ground exists from the start (and it should be noted that this involves examining the history and wider context of the negotiation) in order to assess whether communication channels may advance or obstruct this goal. If inter-party differences are salient from the start, then rich media may help defuse the situation (Postmes, Spears, & Lea 2002). But when a common ground has been established, negotiators may actually benefit from using minimalist means of communication (Postmes et al. 1998). Recognition of similarity may be espe-
cially apparent when negotiators share a common cultural background (e.g. when they have the same nationality). However, enjoying the same cultural background is only one type of categorization that might serve to establish common ground and thereby facilitate the recognition of some form of shared identity (for example, one negotiator can also identify with another because they hold similar attitudes towards innovation). This implies that despite the fact that international negotiations confront the issue of cultural differences, negotiating parties may find significant potential to form a shared identity around a dimension other than cultural and thereby build on a perception of shared identity among them.

The above discussion might create a rather confusing impression of how the complexities of negotiation as a social process interact with the characteristics of the technology that support it. We believe that this confusion is in some way good: it reminds us that technological solutions will not come easily. This complexity also accentuates the importance of communication, social processes, and (cultural) identity concerns to any method or system of negotiation support. Initial research on NSS has focused a lot of attention on how and when to deliver the right information in order to productively support negotiations. Less attention has been devoted to the social demands that negotiations place on the communication environment (Thiessen, Loucks, & Stedinger 1998; Zigurs, Reitsma, Lewis, Hübscher, & Hayes 1999). This may be due to the strong influence exerted by existing group decision support systems (GDSS) on the way in which the field of NSS is evolving. Most GDSS systems are designed on the premise that decisions can be improved if such systems can remove all social processes from group decision making (obstructing direct communication, for example). This is based on the belief that many group social processes are counterproductive to good decisions. In our view, this is the wrong way to go: supporting and stimulating the social process of negotiation is vital and thus should be at the top of our agenda. Just as we prompt others not to ignore communication, we ourselves should not fall into the trap of ignoring information.

**Information Provision**

It is quite ironic that information is often considered an entirely separate aspect of negotiations than communication climate and the social process; there actually is a great deal of overlap (so much so that the distinction is highly artificial in many cases). It is obvious that communication is crucial for the dissemination of information. Information is also crucial, in part because of its effect on communication between negotiators.

The central role of information in negotiations is related to the conflicts of
interest that often exist between negotiators. Great discrepancies in knowledge, information, and interpretation of the situation generally accompany these conflicts and disagreements (Thompson, Peterson, & Kray 1995). Research has shown that the parties’ perception of the problem, especially at initial stages of negotiation, is of critical importance to negotiation outcomes (Lewicki, Litterer, Minton, & Saunders 1994). The more perceptions differ, and the more negotiators’ interpretations of the situation, the problem, and potential solutions diverge, the less likely it is that a productive and workable solution can be reached. If that were not bad enough, negotiations can actually deteriorate over time rather than improve, even when negotiators do communicate with each other (the example given above of inter-cultural differences exacerbating misunderstandings is one such case). The parties’ initial, different cognitions about the problem often diverge rather than converge over the course of negotiations, and if unchecked, influence the negotiation process in a negative way (Lewicki et al. 1994). Most authors therefore agree that identifying and eliminating systematic biases in negotiators’ perceptions are important first steps in dealing with negotiations (Neale & Bazerman 1991). Thus, providing information should be an important objective for Negotiation Support Systems. This information should be geared towards the maximization of shared cognition among negotiators. However, there may be certain requirements for the kinds of information supplied, as we shall elaborate in the discussion.

There are several problems that negotiators with divergent cognitions about the problem face and that obstruct settlement. Perhaps the most important is that a converging perception of reality among negotiators is a prerequisite for communication and mutual understanding. Literally and figuratively, not speaking the same language precludes comprehension (Postmes 2003; Turner 1991). Also, cultural differences are an important factor to consider as sources of misunderstanding. Another problem arises when negotiators fail to recognize why the other parties’ problems are valid – the object of negotiations remains unclear. Similar problems exist if parties disagree on what valid solutions are or the values and costs of solutions. Finally, parties frequently hold different or competing conceptions of the situation in which the problem occurs. This may, often indirectly, frustrate the negotiation.

If such disagreements in the perceptions of the situation, problem, and solutions do not exist, negotiators may be said to have reached shared cognition. Shared cognition may aid the negotiation in two ways, either directly or indirectly. The direct route is obvious: if negotiators “speak the same language” they can bargain and communicate with each other and this, ultimately, is the way to resolve conflict and attain a negotiation settlement. For example, research has shown that providing negotiators with graphical dis-
plays of the problem task established a common framework in which they interacted and communicated perspectives (Massey & Wallace 1996). Shared cognition creates the potential for, but does not automatically lead to, settlement by facilitating communication. It might be that shared cognition contributes to a sense that the goals of the different parties are irreconcilable: they agree to disagree. Viewed in this light, shared cognition not only enables negotiators to reach agreement, it also should improve their understanding of and communication about disagreements.

Shared cognition may indirectly further settlement because the process of achieving shared cognition in itself may lead negotiators to perceive common group membership. The language metaphor again serves well to illustrate this point: most people who discover they speak the same language (when abroad on vacation, for example) will be drawn to each other. Likewise, having the same cultural background or thinking similarly about certain issues (however banal) can give people a strong sense of common identity, a recognition that they are of “a similar kind.” This might be especially important for purposes of international negotiation. In situations where people’s native languages or cultural backgrounds differ, participants may have to work especially hard to find other dimensions on which they can converge. As mentioned above, the possibility of establishing common ground and developing a common identity is a strong predictor of negotiation settlement.

Of course, the question remains how NSS can provide information in such a way that shared cognition is likely to ensue. One possible answer is by giving the same feedback to all negotiators, using aids such as displays with (interactive) graphs, figures, and visual models (Arunachalam & Dilla 1995; Boland, Ramkrishnan, & Te’eni 1996; Northcraft & Earley 1989; Sengupta & Te’eni 1993). These displays could provide similar information to all negotiators throughout the negotiation about their potential decisions, and thereby reduce the chances of diverging impressions of what is at stake. Several studies indeed have suggested that providing feedback during negotiation strongly influences negotiators’ cognitions about the problem and possible solutions (Swaab, Postmes, Neijens, Kiers, & Dumay 2002). Whatever tools are used, though, the object of an NSS should be to provide an unambiguous representation of the information that is central to the negotiation problem, and this information should be presented in such a way that it is likely to contribute to converging perceptions and shared cognition (Swaab et al. 2002).

In sum, supplying certain kinds of information should be an extremely important consideration when providing negotiation support. The object of providing this information is to promote shared cognition among negotiators, which should facilitate communication between them, and thereby, potentially enable settlement. Moreover, we expect that there are indirect benefits of
shared cognition in that it should stimulate the development of a common social identity which can bridge divides of any form between parties, and thereby prove to be the nucleus of settlement. Based on the literature reviewed above, we present our theoretical framework in Figure 1.

**Antecedent Negotiation Support**

**Negotiation Process**

![Diagram](image)

*Figure 1. Communication and information as antecedents of NSS*

**Prior Research**

Several studies have examined the impact of information on shared cognition. One of our initial studies on the effects of information provision on aspects of the negotiation process and outcome was quite successful in showing that an NSS can boost shared cognition among negotiators (Swaab et al. 2002). As we argued before, NSS should seek to stimulate a climate where negotiators can develop a common identity. One of the ways of doing this is by helping negotiators develop shared cognition by providing unambiguous information about the problem and potential solutions, thereby minimizing misunderstandings and establishing common ground from which solutions can be investigated.

In the experiment, these ideas were put to the test by comparing two conditions: 14 negotiating groups were either supported by an NSS or they were not (Swaab et al. 2002). The support consisted of an extensive range of visual aids, which the facilitator used to introduce and present the problem prior to negotiation, and a simulation model, which helped negotiators explore different potential solutions throughout the negotiation session. In the control condition, negotiators had access to the same kind of information, but this information was not presented to the negotiators as a group. Instead, it was scattered throughout a range of different sources, some on paper, some on a flip
chart, and some on maps depicting the problem area. The main difference between conditions, then, was that in the NSS condition all information was presented on one screen (visible to all), whereas multiple sources of information were used in the control condition.

Within this context, negotiators had to solve a spatial planning dispute concerning issues of innovation. Accordingly, each of them was assigned the role of a major corporation, government institution, or pressure group. The negotiation task was a fixed-pie problem, meaning that negotiators bargained with each other over the proportions of scarce, divisible goods. The results showed that groups that received negotiation support developed more shared cognition than those that did not. Shared cognition, in this study, was operationalized as the amount of overlap that existed after task completion in the negotiators’ perceptions about different properties of the problem and its solutions. Negotiators in the NSS condition perceived the negotiating task more similarly than those in the control condition. Interestingly, the overlap in cognitions was also associated with several positive social outcomes. Most notably, shared cognition was – as hypothesized above – related to greater identification with a common group membership. Furthermore, there was an indication that shared cognition and identification would benefit negotiation outcomes: groups in the NSS condition reached significantly higher consensus levels.

In sum, our initial study confirms that NSS may have a reliable impact on group processes and negotiation outcomes. Moreover, this study illustrates the importance of providing information in such a way that shared cognition ensues. In follow-up research, we have attempted to examine further and with greater precision how information can be provided to stimulate the formation of shared cognition. In particular, we sought to distinguish the influence of the different aspects of the NSS used in our prior research. This follow-up research also seeks to establish those conditions under which shared cognition furthers the attainment of positive negotiation outcomes.

Study

The follow-up study that we shall report here is essentially a more controlled version of the study described above. This most recent study sought to establish once more that the presentation of information can influence the degree to which shared cognition develops. Moreover it sought to refine Study 1 by testing a relatively minimal variation of the way in which information is presented. In the prior research (Swaab et al. 2002), we varied both the degree to which information was available and visible to all in one location (a big
semi-circular screen in front of which the negotiations took place versus individual sources) and the form in which this information was available (computerized versus on paper and other sources). The present study attempted to vary merely whether information was available for all to see (on a big screen in front of the group) or available to individuals (on separate monitors that only a single negotiator could see).

A further difference from the first study (and one that turned out to be quite important, we believe) is that in the prior research the facilitator devoted considerably more time to reviewing different potential solutions with the negotiators prior to the actual negotiation. Thus, our feedback in this follow-up devoted relatively more attention to introducing the problem and its ramifications, but much less time to how the problem could be solved. It is important to note at the outset that this meant that the information provided in the second study was not as extensive and not the same as that furnished in Study 1.

Within this framework, 17 groups of undergraduate students negotiated a spatial planning problem similar to that in the prior research. They were assigned roles and given feedback about the problem by a facilitator using one of two kinds of NSS: one presenting information collectively, one presenting information individually. Negotiators then tried to reach a settlement. After the negotiations, we assessed to what extent negotiators had achieved shared cognition about the problem they faced, and how their solutions compared with the optimal agreement.

Method

Design and participants. Fifty-one Dutch first and second year undergraduate students (28 women and 27 men) from the University of Amsterdam, varying in age from 18 to 24, participated in the study. They received seven Euros for their participation and were randomly assigned to their roles and experimental conditions (collective vs. individual). None of the group members had a history of working together within their particular group or experience with spatial planning tasks.

Negotiation task. Each participant represented a different party and held interests that conflicted with other parties’ interests (see Appendix for more information). The purpose of the task was to explore the possibility of reaching a joint agreement that would maximize the parties’ returns. In this simulated business game, based on the real-life negotiations surrounding innovation and spatial planning issues in the harbor of Rotterdam, the participants needed to reach consensus. In the game, three of these parties negotiated whether inno-
In the collective condition, we had negotiators facing a common screen (5 × 5 feet), upon which all information was displayed. In the individual condition, negotiators received the same information, but on private screens that were placed before each individual negotiator (at a distance of approximately 60 cm) such that negotiators could not see the others’ screens.

Dependent measures. We had two dependent variables in this study. To measure problem perception (two items), we asked participants to what extent they...
thought their interests were compatible with those of the other party (items were “my ideal solution is the opposite from what the other wants” and “my goals are incompatible with those of the others”). Cronbach’s alpha (.80) was reliable. This provided an estimate of the attainment of shared cognition, in that the correct perception was that parties’ interests were not compatible. The quality of the negotiated decision was measured by calculating the distance between the group’s final decision and the most optimal arrangement, a pre-fixed distribution calculated by the simulation model.

Results

Problem perception. The negotiators’ perceptions of the problem at hand were assessed at two times: immediately after the feedback was given to them (pre-negotiation) and after they had concluded the negotiation task (post-negotiation). Results showed that already immediately after the feedback was provided, perceptions of the problem differed across conditions, $F(1,15) = 6.84, p = .02$. Groups in the collective condition ($M = 4.98; SD = 0.47$) had better perceptions of the problem compared to those in the individual condition ($M = 4.19; SD = 0.72$); they recognized better what disagreements existed and, in this sense, shared cognition existed about the problem at hand. After the negotiations, a similar effect was found: groups in the collective condition ($M = 4.15; SD = 0.66$) had better perceptions of the problem than those in the individual condition ($M = 3.35; SD = 0.61$). The significant effect between the two conditions, $F(1,15) = 6.62, p = .02$, supports our hypothesis that providing feedback collectively stimulates shared cognition with regard to problem perceptions.

Quality. In their final solution, negotiating groups in the collective screen condition reached settlements that were further from the optimal distribution ($M = 0.49; SD = 0.18$) than those in the individual screen condition ($M = 0.30; SD = 0.10$). The effect was significant $F(1,15) = 7.39, p = .02$, and showed that – contrary to results in the prior research – negotiation settlement was actually poorer in the collective condition, when there was more shared cognition.

Discussion

The results from this follow-up study are encouraging in that they confirm our idea that negotiation support may further the formation of shared cognition by focusing negotiators on commonalities. Simply equipping an NSS with a col-
lective screen versus individual displays (while keeping the actual information provided constant) had strong effects on the perceptions of the problem: collective representation of the problem led to more similar problem perceptions, indicating that shared cognition developed. Conversely, presenting the same information but on individual displays led to more faulty perceptions of the problem. However, to our surprise, the nature of the NSS employed affected the quality of the decision differently than in prior research. It would appear that more similar problem perceptions lead to decreased quality in the negotiated settlement. A likely explanation might be the nature of the information we provided with the NSS. The information provided in the initial phase of the study consisted of feedback about the problem and a presentation of the ideal solutions for each party. This is only information about the problem, not about any collective solutions. The fact was that people who received this information on a collective screen paid more attention to it and perceived the problem as greater, probably so much so that it actually hindered them from attaining higher quality solutions. These groups focused on the fact that the problem was very difficult to solve (a truthful assessment), more so than the groups in the control condition that did not perceive the real contradictions between parties. Thus, those groups that perceived the information on individual screens might have more easily reached a solution and were not as aware of their own and competitors’ ideal scenarios. These groups stayed less focused on the actual problems, which gave them the opportunity to reach an effective outcome.

We can conclude two things from this follow-up study. First, we warn that the nature of support should be very carefully considered and tailored to suit the particular negotiation at hand. In particular, NSS should be equipped not just to present information to negotiators in different ways, but also due consideration should be paid to the nature of the information to be provided.

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Table 1. Means of variables in the study

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Second, relatively minor changes in the nature of an NSS can have big impacts on the way in which negotiations are conducted. Presenting negotiators with information should be a prime way for NSS to influence the negotiating parties’ perceptions of the problem and solutions. This, in turn, substantially shapes how negotiations are conducted and disagreements resolved. Results from these two studies attest to the powerful impact that presenting information collectively has on negotiators’ perceptions of the problem. That the collective display of information can be used to achieve shared cognition about the problem and – importantly – about feasible solutions would appear to be an important lesson from the research reported above.

Implications for International Negotiation

Our research thus far illustrates that the framework described in this article may be beneficial for NSS design and may have implications for NSS research more generally. We noted that NSS researchers still focus primarily on technological solutions; the social problems that they purport to solve are only secondary (Lim & Benbasat 1993). In a sense, however, the results of the second study underline how important it is to be sensitive to the ecological demands of the social process in designing NSS. We therefore argue that a careful analysis of the social and psychological processes should provide a primary basis for NSS design, alongside technological considerations.

This may be an especially important consideration in international contexts, where the use of technological aids to support negotiations over longer distances is likely to be seen as a useful innovation that could save negotiators time and money. The results from prior research and the findings presented in the present article suggest that the use of NSS need not necessarily exacerbate inter-cultural differences in the sense that it has been established that shared cognition can be fostered by particular configurations of technology. However, the findings also suggest that the degree to which NSS can succeed in international contexts (or in other contexts, for that matter), and contribute to more productive outcomes such as consensus, depends critically on whether the NSS can stimulate the development of a shared identity that breaches the boundaries of culture and nationality (Swaab et al. 2002). However, much future research is needed to disentangle and identify the many factors involved and to identify those aspects of an NSS that can promote group identification under particular social circumstances (e.g. in heterogeneous cultural groups such as in international negotiations).

As we suggested before, the promotion of common identities may be strongly related to the development of shared cognition. Shared cognition, which we defined as a shared understanding of the negotiation, is a second
important factor that NSS can try to influence. As a result of providing unambiguous information about the negotiation to the collective of negotiators, more similar perceptions developed among them in both studies. However, the issue of determining what one should develop shared cognition over may be critical. It appears that shared cognition should be not just about problems facing the negotiators but also about the possibilities for solutions and common ground. Nevertheless, it is clear that the way in which information is provided has far-reaching implications for how it is perceived and may also influence the social relations among negotiators: information provision is a powerful factor for negotiation support, and it would be prudent if follow-up research would take this into account.

Limitations

Although the results support the idea that information provision, such as NSS, may be productive, it may be observed that the use of the experimental sample (student groups) may limit the study’s generalizibility (Dennis, Nunamaker, & Vogel 1991). Indeed, we recognize the importance of establishing the value of these systems in less-artificial contexts such as the laboratory setting (Ulijn 2000). The systems used in other studies have indeed been tested in real-world negotiations, and we were pleased to witness that these NSS are not merely effective among students. In a workshop, we had “real” negotiators working with the same NSS as were used in our two experimental studies. Post-negotiation interviews indicated that these “real” negotiating groups were stimulated to engage in more problem-solving behavior (Swaab et al. 2002).

Another limitation of the present research is the type of negotiation for which the NSS can be used. The task in both studies had some integrative potential, indicating that by means of making trade-offs participants were able to reach higher joint gains than they otherwise would. So, it might be that the NSS used in this study is especially suitable for integrative negotiations, in contrast to distributive negotiations where parties just “slice the pie” (Thompson 2000). For example, in distributive negotiations, a shared understanding might lead negotiators to realize that there is no optimal solution because they have to divide something they all desire. This will lead them to focus on sub-optimal outcomes. However, during integrative negotiations (expanding the pie), a shared understanding leads negotiators to discover the integrative potential, which provides an opportunity for the parties involved to integrate their interests. In these situations, issues that are most valuable to one group member (in that they represent the most profitable concern) are always less valuable to the other group members, which makes it possible to
trade-off between issues (so-called logrolling). How these different types of negotiation influence and limit the applicability of NSS is an interesting question deserving further investigation in future research.

Also, findings might be limited to spatial planning conflict issues. The visual information provided, which formed the backbone of our NSS, is especially appropriate for this type of negotiation issue. However, the more general conclusion that we draw from our findings stands; namely that the provision of unambiguous information aids negotiation settlement through the development of common identities and shared cognition.

Conclusion

We presented a framework suggesting that NSS and negotiation support in general should take into account the ecology of negotiations. Support can best succeed if it takes into account and supports the social processes that occur during negotiations. We provided data to illustrate that the provision of information is a very powerful instrument that influences negotiation process and outcomes in several ways. Importantly, our results show that the effects of information provision in NSS are not unequivocal but might have different effects as a result of subtle changes. However, we also stress that the provision of information should not make us overlook the importance of supporting and stimulating the social process of negotiation, which should be at the heart of any NSS. Recognizing that negotiations always involve complex communications through which parties may or may not establish a common identity means that NSS can make a significant difference if they succeed in facilitating this social dimension successfully. In sum, we believe that if its purpose is to meaningfully aid settlement and conflict resolution, NSS design should aim to overcome cultural and subgroup differences by fostering common group identities and the development of shared cognition.

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Appendix: Negotiation Task

Participants performed a negotiation task in which each individual represented a different party that held interests that conflicted with the interests of other group members. The purpose of the task was to explore the possibility of reaching a joint agreement that would maximize the parties’ returns. The negotiation task was a simulated business game concerning innovative issues and was based on real-life negotiations surrounding spatial planning in the harbor of Rotterdam, a negotiation in which several parties with conflicting interests needed to reach consensus. In the game, three of these parties negotiated whether investigations in the available ground should be used for buildings and factories, new roads, or in noise-decreasing projects. Every participant played a different role and had to maximize the result for its party (egoistic motive). One participant played a representative of an industrial organization, a second participant negotiated on behalf of the Ministry of Transport, Public Works, and Water Management, and the third participant represented a civilian interest organization. Group members negotiated about three issues: an economically-wealthy harbor, fewer traffic jams, and decreased noise.

Each negotiator received a role description with a profit schedule consisting of three levels. The first was that which was most desirable (an overexerted one), the second was moderately desirable (the one with the most integrative potential), and a third level described the minimum that party could agree to (although this was not desirable). Participants were instructed to negotiate a certain amount of the available ground that would meet their objectives. The task was constructed in such a way that all the interests were interrelated and conflicting with one another. Plans were displayed in the simulation model in terms of returns for the different parties (decrease/increase of financial profits, traffic jams, and noise).

The industrial organization wanted to expand. This policy was financially attractive, but would lead to more traffic jams and increased noise levels. The civilian organization wanted to realize solutions to decrease the excessive noise levels. In terms of financial and environmental returns, this plan was environmentally-friendly, but financially less attractive for the industrial organization. The problem for the civilian organization was that it had no budget available for the realization of its plans, and was thus dependent on investments by the Ministry and by the industrial organizations. The civilian organization’s objective was thus to persuade the Ministry (although it could threaten to initiate a lawsuit). The Ministry played a different role than the other two actors. Its main objective was to alleviate the traffic jams, but it also desired to develop a shared policy in the harbor area that would be acceptable to both industry and civilians. This policy needed to meet two requirements: it should improve the economic welfare of the region and contribute to a liveable region. The ministry could penalize plans that would be harmful to the environment by imposing construction licenses.
References


